

Claims:

- 5 1. An unlicensed-radio access network for connecting a mobile station to a
core network portion of a licensed-radio mobile network, said unlicensed-
radio access network including an access controller connected to said core
network portion, a broadband packet-switched network connected to said
access controller and having a plurality of access points, each said access
10 point defining at least part of a mini-cell coverage area and supporting an
unlicensed-radio interface permitting communication between mobile
stations located within a respective mini-cell and said access controller,
wherein said access controller comprises a first link control relay module
(35) for relaying packet service frames and a second transport protocol
15 module (32, 33), characterised by comprising a third link control module
(34) arranged between said first and second modules for receiving packet
service frames from said first link control relay module (35) determining a
transmission priority assigned to each packet frame and forwarding said
packet service frames to said first transport protocol module (32, 33) in an
20 order corresponding to said assigned transmission priority.
2. An access network as claimed in claim 1, further characterised in that said
third link control module (34) comprises a plurality of buffers (110) for
storing said packet service frames, each buffer corresponding to a specific
25 transmission priority and being adapted to receive packet service frames of
the specific transmission priority only.
3. An access network as claimed claim 2, further characterised in that said
third link control module (34) is further adapted to determine an
30 acknowledgement mode of a packet service frame and to store a packet

service frame assigned an acknowledgement mode in a buffer (110) for a period after transmission until acknowledgement said frame is received.

4. An access network as claimed in claim 2 or 3, further characterised in that
5 said third link control module (34) comprises multiple sets ($111_1 - 111_n$)
of said plurality of buffers (110), each set corresponding to a specific
mobile station and being adapted to receive packet service frames destined
for the specific mobile station only.
- 10 5. An access network as claimed in any previous claim, further characterised
in that at least one access point (20') is provided with a transport protocol
module (22, 23), adapted to receive packet service frames from said access
controller (30') and an unlicensed radio module (11, 212, 213) for
15 exchanging packet service frames with a mobile station over an
unlicensed-radio interface, characterised in that said access point further
includes a link control relay module (24) adapted to queue packet service
frames received from said transport protocol module (22, 23), determine a
transmission priority assigned to each packet frame and forward said
20 packet service frames to said unlicensed radio module (11, 212, 213) in an
order corresponding to said assigned transmission priority.
6. An access network as claimed in claim 5, further characterised in that said
link control relay module (24) is further adapted to determine an
acknowledgement mode of a packet service frame and to assign each
25 packet service frame to an unlicensed-radio protocol with an equivalent
acknowledgement mode.
7. An access network as claimed in any previous claim, characterised in that
said transport protocol modules provide for a datagram service over the
30 Internet Protocol (IP).

8. An access network as claimed in claim 7, further characterised in that said datagram service is the User Datagram Protocol (UDP).
- 5 9. A mobile station adapted to exchange packet service frames with a core network portion of a licensed-radio mobile network via an unlicensed-radio access network, said mobile station including a first link control module (15) for generating packet service frames and a second unlicensed-radio module (11) for exchanging packet service frames with an access
10 point of said unlicensed-radio access network over an unlicensed-radio interface, characterised in that said mobile station further comprises a third link control module (14) arranged between said first and second modules for receiving packet service frames from said first link control module (15) determining a transmission priority assigned to each packet frame and
15 forwarding said packet service frames to said second unlicensed-radio module (11) in an order corresponding to said assigned transmission priority.
- 20 10. A mobile station as claimed in claim 9, further characterised in that said third link control module (14) comprises a plurality of buffers (110) for storing said packet service frames, each buffer corresponding to a specific transmission priority and being adapted to receive packet service frames of the specific transmission priority only.
- 25 11. A mobile station as claimed claim 10, further characterised in that said third link control module (14) is further adapted to determine an acknowledgement mode of a packet service frame and to store a packet service frame assigned an acknowledgement mode in a buffer (110) for a period after transmission until acknowledgement said frame is received.

12. A method in an unlicensed-radio access network for connecting a mobile station to a core network portion of a licensed-radio mobile network, said unlicensed-radio access network including an access controller connected to said core network portion, a broadband packet-switched network
5 connected to said access controller and having a plurality of access points, each said access point defining a mini-cell coverage area and supporting an unlicensed-radio interface permitting communication between mobile stations located within a respective mini-cell and said access controller, wherein said access controller comprises a link control relay module (35)
10 for relaying packet service frames and a transport protocol module (32, 33)said method being characterised by
in said access controller, receiving packet service frames from said link control relay module, determining a transmission priority assigned to packet frames destined for a mobile station and forwarding said packet
15 service frames to said second transport protocol module in accordance with a first algorithm based on said assigned transmission priority.
13. A method as claimed in claim 12, further characterised by the steps of:
in said access controller determining an acknowledgement mode of a
20 packet service frame received from said link control relay module and storing a packet service frame assigned an acknowledgement mode for a period after transmission until acknowledgement said frame is received.
14. A method as claimed in claim 12 or 13, further characterised by the steps
25 of: in said access controller determining the destination mobile station of packet service frames received from said link control relay module and applying a second algorithm to select among packet service frames destined for different mobile stations before applying said first algorithm.
- 30 15. A method as claimed in any one of claims 12 to 14 further characterised

by the steps of:

in an access point, receiving packet service frames from said access controller,

determining the assigned destination priority of said packet service frames

5 and,

forwarding said packet service frames to a mobile station in an order defined by a third algorithm based on destination priority.

16. A method as claimed in any one of claims 12 to 15, further characterised

10 by the steps of:

in an access point, receiving packet service frames from said access controller,

determining an acknowledgement mode of a packet service frame, and

assigning each packet service frame to an unlicensed-radio protocol with

15 an equivalent acknowledgement mode.

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